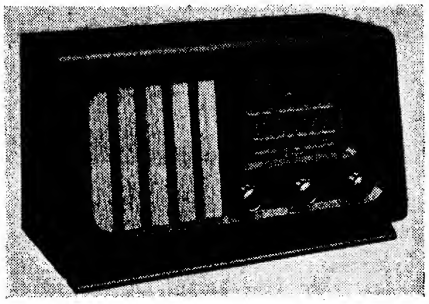
"TRADER" SERVICE SHEET

911

ALBA 3531, etc.

Covering Models 3531, 3511, 8531, 4551, 475B (Single) and 475B (Auto)



The appearance of the 3531 table receiver on which this information was prepared.

SIX models are covered in this *Service Sheet*, three of them being radio receivers only and three of them radiograms. Our sample, from which the following information was prepared, was a model 3531, a 4-valve (plus rectifier) 3-band superhet designed to operate from A.C. mains of 200-250 V, 40-100 c/s.

The other five models are 3511 table radio, 4551 console radio, 8531 table autoradiogram, 475B radiogram and 475B autoradiogram. The differences between these models and our sample are explained under "Associated Models" overleaf.

Release dates and original prices: 3531, *September* 1948, £18 5*s*; 3511, *September* 1948, £16 5*s*; 4551, *December* 1948, £25 4*s*; 8531, *September* 1948, £36 15*s*; 475*B* (*single*), *December* 1948, £48 6*s*; 475*B* (*auto*), *December* 1948, £54 12*s*. *Purchase tax extra.*

CIRCUIT DESCRIPTION

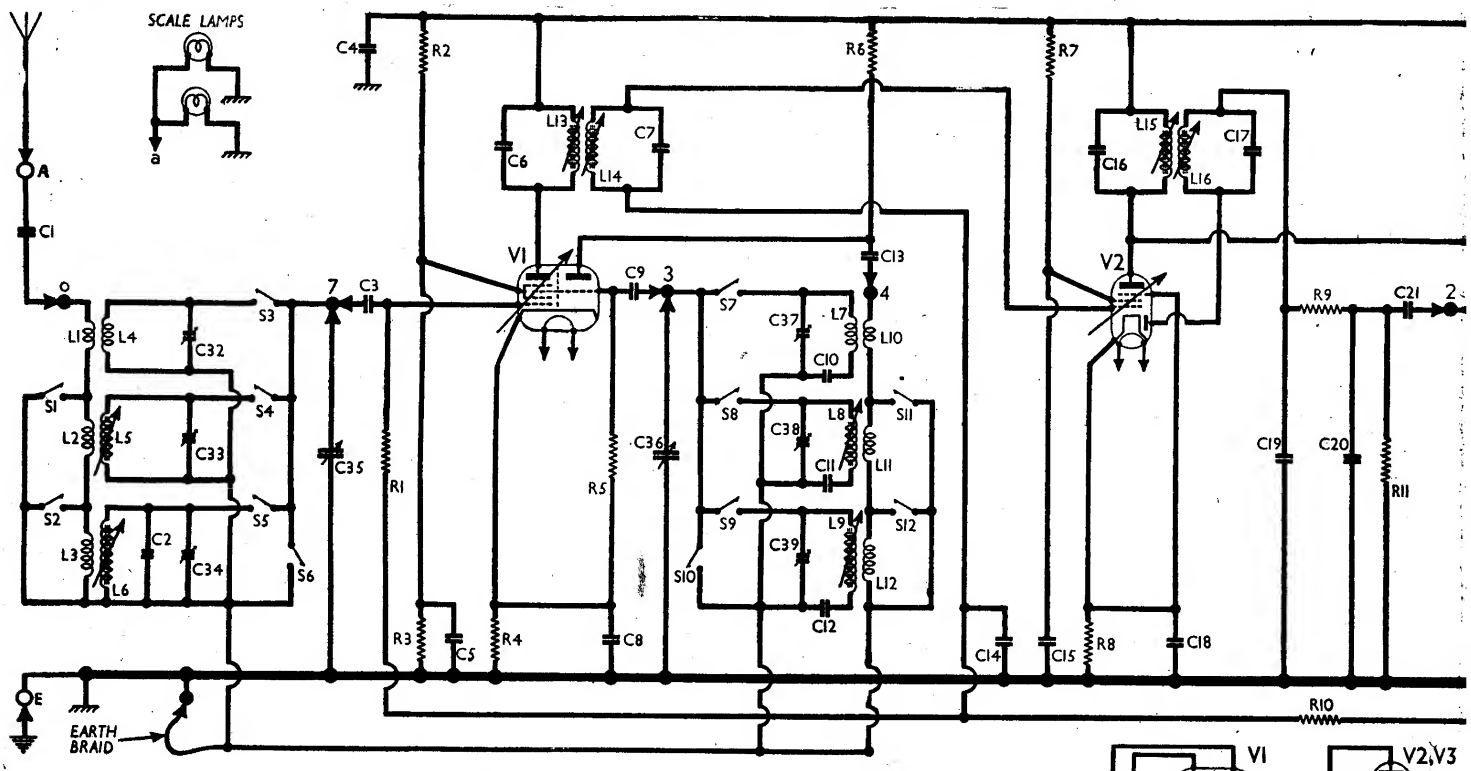
Aerial input, via series capacitor **C1,** is inductively coupled by **L1** (S.W.), **L2** (M.W.), **L3** (L.W.) to single-tuned circuits **L4, C35** (S.W.), **L5, C35** (M.W.) and **L6, C35** (L.W.) which precede a triode-hexode valve **(V1, Mullard UCH42)** operating as frequency changer with internal coupling.

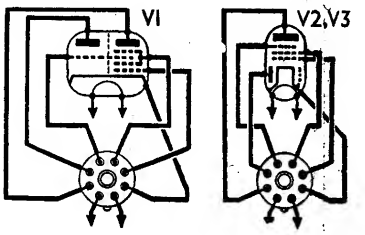
Triode oscillator grid coils **L7** (S.W.), **L8** (M.W.), **L9** (L.W.) are tuned by **C36,** with parallel trimming by **C37** (S.W.), **C38** (M.W.), **C39** (L.W.), and series tracking by **C10** (S.W.), **C11** (M.W.), **C12** (L.W.). Reaction coupling from anode, via **C13,** is by coils **L10** (S.W.), **L11** (M.W.) and **L12** (L.W.).

Second valve **(V2, Mullard UAF41 or UAF42)** is a single diode variable-mu R.F. pentode operating as intermediate frequency amplifier and second detector. The pentode section of **V2** is tuned-transformer coupled by **C6, L13, L14, C7** and **C16, L15, L16, C17** and, as the tuning capacitors are fixed, alignment adjustments are carried out by varying the positions of the iron-dust cores.

Intermediate frequency 455 kc/s.

The audio frequency component in the rectified output of **V2** diode section is developed across load resistor **R11** and





Circuit diagram of the Alba 3531 3-band A.C. table receiver. The circuit differences in the associated models concern only the tone control circuit **C25, R20,** which is sometimes omitted. The full differences in these models are explained under "Associated Models" overleaf. Numbered points in the circuit show where connections occur between the tuning assembly and the chassis.

passed, via A.F. coupling capacitor **C21,** radio muting switch **S13,** volume control **R12** and grid stopper **R13,** to C.G. of a second single diode variable-mu pentode valve **(V3, Mullard UAF41 or UAF42),** the pentode section of which operates as A.F. amplifier.

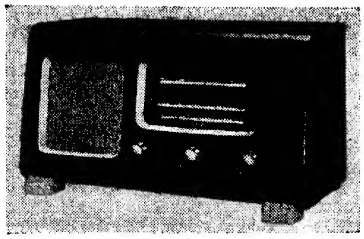
I.F. filtering is by **C19, R9, C20** in diode circuit, and **R13** in **V3** C.G. circuit, and provision is made for the connection of a gramophone pick-up across **R12,** via **S14.**

The diode section of **V3,** fed from **V2** pentode anode via **C24,** provides D.C. potential which is developed across load resistor **R19** and fed back through a decoupling circuit **R10, C14** as G.B. to F.C. and I.F. valves, giving automatic gain control.

Resistance-capacitance coupling by **R18, C26, R21,** via grid stopper **R22,** between **V3** pentode anode and pentode output valve **(V4, Mullard UL41).** Variable tone control by **C25, R20,** and fixed tone correction in **V4** anode circuit by **C28.**

The A.F. voltage developed across the secondary winding of the output transformer **T1** is applied, via a potential divider **R16, R24,** to **V3** cathode circuit, giving negative feed-back, and provision is made for the connection of a low-impedance external speaker across this winding.

H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Mullard UY41).** Smoothing by iron-cored choke **L18,** resistor **R25** and electrolytic capacitors **C29, C30, C31,** and H.T. circuit R.F. filtering by **C4.** The heaters of all valves are series-connected and fed from tappings **x, y** on **T2** secondary winding, and the parallel-connected scale lamps are fed from tappings **y, z.**



The appearance of the **Alba** 3511 table receiver.

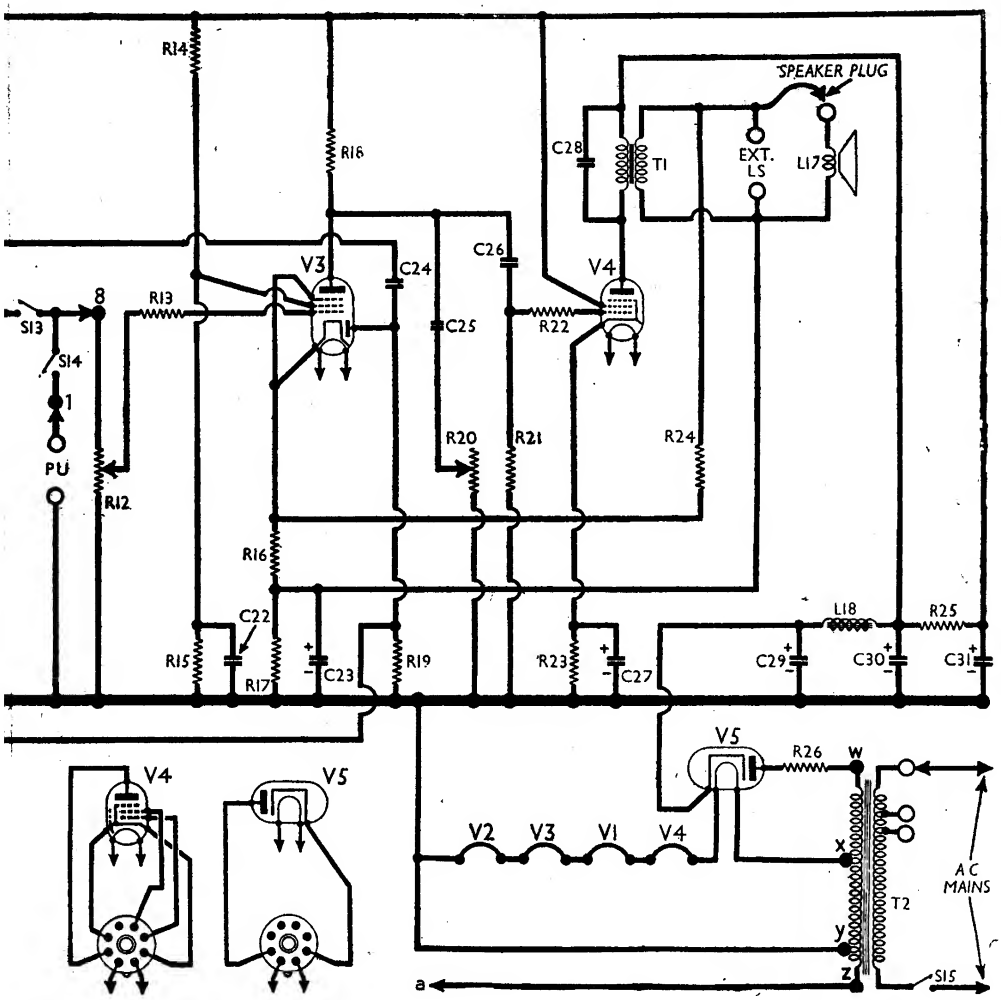
COMPONENTS AND VALUES

	RESISTORS	Values (ohms)	Locations
R1	V1 hex. C.G. ...	1,000,000	J4
R2	V1 S.G.'s H.T. potential divider ...	18,000	K5
R3		27,000	K5
R4	V1 fixed G.B. ...	200	J4
R5	V1 osc. C.G. ...	47,000	J4
R6	Osc. anode load ...	22,000	K5
R7	V2 S.G. H.T. feed	47,000	J5
R8	V2 fixed G.B. ...	300	H5
R9	I.F. stopper ...	47,000	B2
R10	A.G.C. decoup ...	1,000,000	H4
R11	Sig. diode load ...	470,000	B2
R12	Volume control ...	1,000,000	G3
R13	V3 C.G. stopper ...	47,000	H4
R14	V3 S.G. H.T. potential divider	470,000	H5
R15		220,000	H5
R16	F.-B. coupling ...	30	G4
R17	V3 G.B., A.G.C. delay	3,300	G4
R18	V3 pent. load ...	220,000	H5
R19	A.G.C. diode load	1,000,000	H4
R20	Tone control ...	1,000,000	—
R21	V4 C.G. resistor ...	560,000	E5
R22	V4 C.G. stopper ...	10,000	E4
R23	V4 G.B. resistor ...	150	F4
R24	F.-B. series ...	500	F4
R25	H.T. smoothing ...	1,500	F5
R26	V5 surge limiter ...	100	F5

	CAPACITORS	Values (μF)	Locations
C1	Aerial series ...	0·0002	L5
C2	Aerial L.W. trim ...	0·000047	N6
C3	V1 hex. C.G. ...	0·0001	K4
C4	H.T. R.F. by-pass	0·25	L4
C5	V1 S.G's decoup. ...	0·05	K4
C6	1st I.F. transformer tuning ...	0·0001	B2
C7		0·00011	B2
C8	V1 cath. by-pass ...	0·1	J4
C9	V1 osc. C.G. ...	0·0001	J4
C10	Oscillator tracking capacitors ...	0·0056	M6
C11		0·000575	M7
C12		0·0002	M6
C13	Osc. anode coup. ...	0·0001	J4
C14	A.G.C. decoup. ...	0·05	J5
C15	V2 S.G. decoup. ...	0·05	K5
C16	2nd I.F. transformer tuning ...	0·0001	B2
C17		0·00011	B2
C18	V2 cath. by-pass ...	0·05	J5
C19	I.F. by-passes ...	0·0001	B2
C20		0·0001	B2
C21	A.F. coupling ...	0·005	G5
C22	V3 S.G. decoup. ...	0·1	H5
C23*	V3 cath. by-pass ...	30·0	G4
C24	A.G.C. coupling ...	0·000012	B2
C25	Tone control ...	0·005	E3
C26	A.F. coupling ...	0·005	H4
C27*	V4 cath. by-pass ...	30·0	F4
C28	Tone corrector ...	0·005	F4
C29*	H.T. smoothing ...	32·0	A2
C30*		32·0	A2
C31*		16·0	L4
C32‡	Aerial S.W. trim ...	0·00005	N7
C33‡	Aerial M.W. trim	0·00005	N7
C34‡	Aerial L.W. trim ...	0·00005	N6
C35†	Aerial tuning ...	0·00053§	A1
C36†	Oscillator tuning ...	0·00053§	A2
C37‡	Osc. S.W. trim ...	0·00005	M7
C38‡	Osc. M.W. trim ...	0·00005	M7
C39‡	Osc. L.W. trim ...	0·00005	M6

* Electrolytic. † Variable. ‡ Pre-set.
§ "Swing" value, min. to max.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Aerial coupling coils	Very low	N6
L2		1·0	N7
L3		71·0	N6
L4	Aerial tuning coils	Very low	N6
L5		2·0	N7
L6		16·0	N6
L7	Oscillator tuning coils	Very low	M6
L8		1·6	M7
L9		4·2	M6
L10	Oscillator reaction coils	Very low	M6
L11		0·5	M7
L12		1·0	M6
L13	1st I.F.trans. Pri.	6·0	B2
L14	1st I.F.trans. Sec.	6·0	B2
L15	2ndI.F. trans. Pri.	6·0	B2
L16	2ndI.F. trans. Sec.	6·0	B2
L17	Speech coil ...	2·5	D1
L18	Smoothing choke...	70·0	C1
T1	Output trans. Pri. ...	240·0	F4
	Sec. ...	0·3	
T2	Mains trans. Pri., total	24·0	C2
	Sec. y-z	Very low	
	Sec. x-y	15·0	
	Sec. w-x	26·0	
S1-S14	W/band switches	—	N7
S15	Mains sw., g'd R12	—	G3



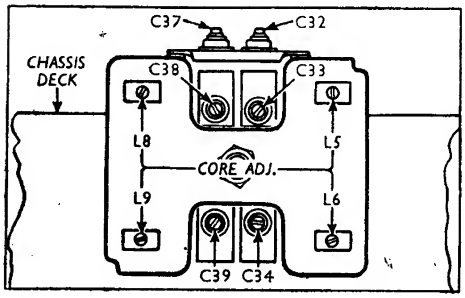
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from mains of 228 V, using the 216-235 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the M.W. band, and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Avometer, except where otherwise stated, chassis being the negative connection.

Valve		Anode		Screen		Cath.
		V	mA	V	mA	V
V1	UCH42	173 (Oscillator) 91	2·4 3·7	74	2·5	1·7§
V2	UAF42	173	5·9	82	1·8	1·9§
V3	UAF42	46	0·5	25	0·4	1·4§
V4	UL41	200	56·0	173	9·5	9·4§
V5	UY41	235†	—	—	—	222

† V, A.C. § 10 V meter range.



Sketch showing the front of the tuning assembly, on which are mounted all the R.F. and oscillator trimmers and core adjustments. Reference is made to this sketch in "Circuit Alignment."

DISMANTLING THE SET

Removing Chassis.—Remove the three front panel control knobs;

from the rear of the cabinet unsolder the two leads to the tone control on the right-hand side of the cabinet;

withdraw the four cheese-head screws (with metal washers) securing the chassis to the base of the cabinet, and slide out the chassis and speaker as a single unit.

Removing Tuning Assembly.—Unsolder from the tag strip on the assembly all the leads connecting it to the chassis, and also the yellow systoflex-covered lead from the assembly to a tag on the volume control, and a braided earthing lead which is joined to a chassis tag on the right of the assembly.

Switch set to S.W., loosen the grub screw of the waveband indicator operating arm, and slide the arm off the switch spindle;

remove the four round-head screws (two with lock washers only, and two with spacing nuts and idler wheels) securing the assembly to the front chassis member, and lift out the assembly.

When replacing, the tops of the two exposed trimmers should project through the cut-away section of the chassis deck, and the long round-head screws (with one idler wheel and spacing nut each) should be used in the fixing holes nearer to the chassis deck. The waveband indicator cord must be run over the idler wheels.

The connecting tags on the assembly are numbered in our underside view of the chassis and circuit diagram, and the leads to them should be resoldered as follows: 1, screened lead from P.U. socket; 2, screened lead from **C21**; 3, leads from **C9** and **C36**; 4, lead from **C13**; 5, no connection; 6, lead from **C1**; 7, leads from **C3** and **C35.** An eighth lead, systoflex covered, which emerges from the front of the assembly is soldered to the right-hand tag of the volume control, and the braided earth lead is soldered to the chassis tag on the right of the assembly.

Waveband Switch Diagram and Table

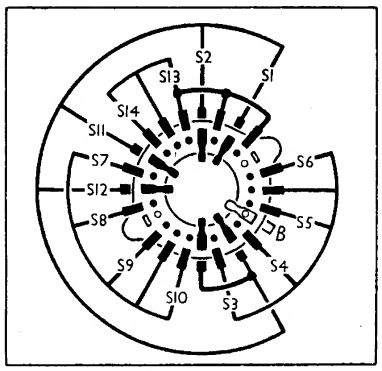
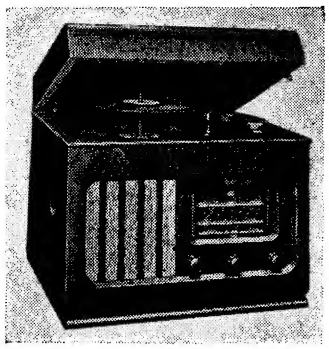
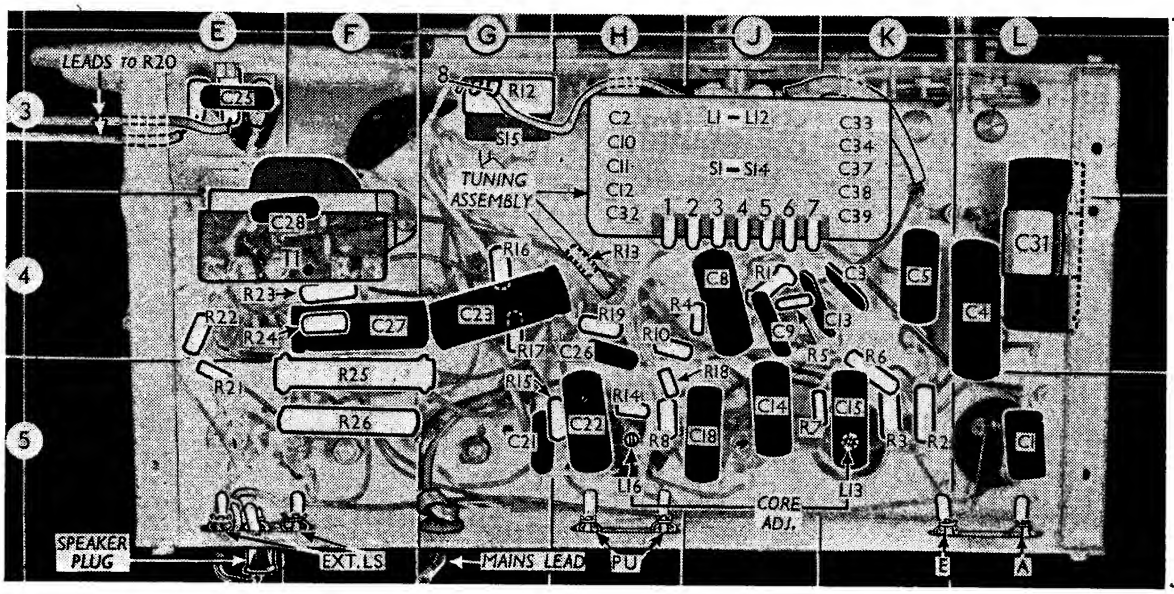


Diagram of the waveband switch unit, drawn as seen from the rear of the tuning assembly when inverted and with the cover removed. The associated table is on the right in col. 3.

Switch	S.W.	M.W.	L.W.	Gram.
S1	C	—	—	—
S2	—	C	—	—
S3	C	—	—	—
S4	—	C	—	—
S5	—	—	C	—
S6	—	—	—	C
S7	C	—	—	—
S8	—	C	—	—
S9	—	—	C	—
S10	—	—	—	C
S11	C	—	—	—
S12	—	C	—	—
S13	C	C	C	—
S14	—	—	—	C



The appearance of the Alba table radiogram 8531, which incorporates a Plessey record changer.



Under-chassis view. The position of the tuning assembly is indicated here, and the numbers of the components it contains are listed. The seven tags are numbered to agree with the same connections in the circuit diagram overleaf. An eighth connection consists of a systoflex covered lead which goes to the volume control.

GENERAL NOTES

Switches.—**S1-S12** are the waveband switches, and **S13, S14** are the radio/gram change-over switches, ganged in a single rotary unit mounted in the tuning assembly. The unit is indicated in our photograph of the inside of the assembly, which shows it in the same position as it is viewed in the diagram in col. 2, where it is shown in detail.

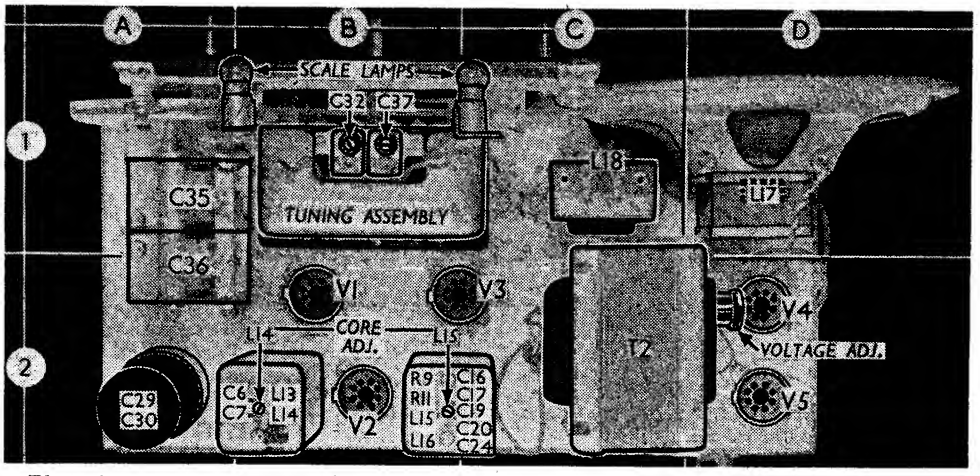
The table (col. 3) gives the switch positions for the four control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and **C**, closed.

S15 is the Q.M.B. mains switch ganged with the volume control **R12.**

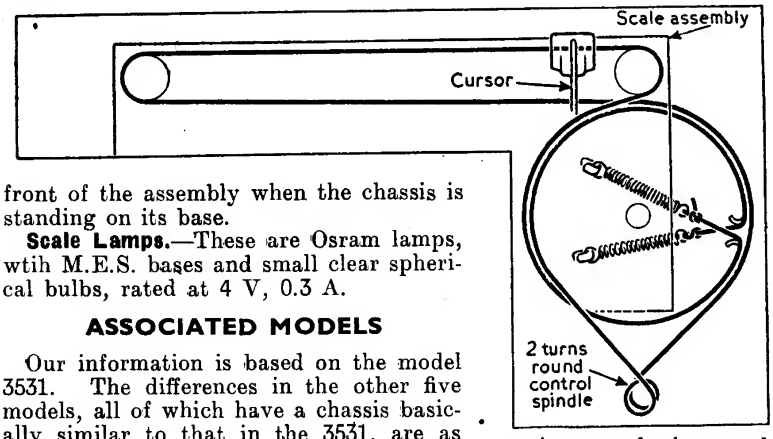
Tuning Assembly.—All the R.F. and oscillator coils **L1-L6** and **L7-L12,** together with their associated trimmers and trackers, are grouped around the waveband switch unit in a dismountable assembly which is mounted on the front chassis member and projects through the chassis deck.

Its position is indicated in our underchassis view, where the components it contains are listed on it, together with the tag numbers on the connecting strip. An illustration of the inside of the unit, as seen from the rear of an inverted chassis after removal of its cover, appears in col. 6. A drawing in col. 1 shows the ten R.F. and oscillators alignment adjustments, all of which are seen from the front of the assembly when the chassis is standing on its base.

Scale Lamps.—These are Osram lamps, wtih M.E.S. bases and small clear spherical bulbs, rated at 4 V, 0.3 A.



Plan view of the chassis. The upper side of the tuning assembly is seen here, with the two visible trimmers indicated. Several components are housed in the second I.F. can, on the right of **V2,** in addition to the transformer itself.



Sketch of the tuning drive system, drawn as seen from the front of the chassis, neglecting obstructions, when the gang is at minimum capacitance. Actually the whole system is behind the scale assembly.

ASSOCIATED MODELS

Our information is based on the model 3531. The differences in the other five models, all of which have a chassis basically similar to that in the 3531, are as follows :

The 3511 is like the 3531, but the tone control circuit **C25, R20** is omitted and the cabinet is different. The 8531 is a table autoradiogram with a Plessey autochanger and a 3531 chassis.

The 4551 is a radio console, in which the scale is larger than that in the 3531 and has four scale lamps, and **S15** is ganged with **R20** instead of **R12,** but otherwise it is like the 3531.

There are two versions of the 475B, one with a single record player and the other with an auto-changer. Both of these have a chassis like that in the 4551 and are housed in horizontal console cabinets.

DRIVE CORD REPLACEMENT

About four feet of fine quality plaited and waxed twine is required for the tuning drive cord replacement. This leaves plenty to spare for tying off. The drive system is shown in the sketch (col. 5), where it is drawn as seen when viewed from the front with the gang at minimum capacitance, showing the gap in the rim of the gang drum.

First tie one of the tension springs to one end of the cord, hook the spring to the lower anchor tag on the drum, run the cord anti-clockwise round the drum and down to the control spindle, then follow the sketch to the end of the run, finally tying off the end of the cord to the second tension spring so that the springs are both extended to about twice their relaxed length when fitted into position.

The scale cursor can be slipped into position and attached to the cord afterwards, as it is kept in position by means of a nut, screw and washer. It should coincide with the ends of the three scale apertures when the gang is at maximum.

CIRCUIT ALIGNMENT

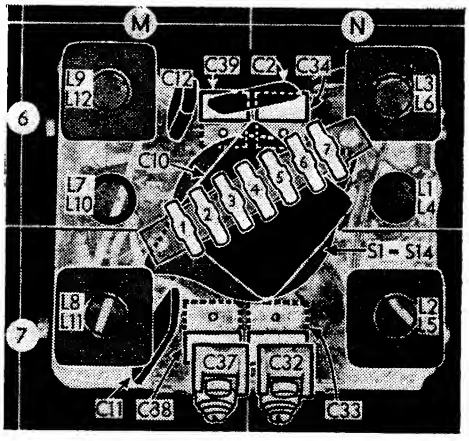
I.F. Stages.—Connect signal generator, via an 0.1 μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and the **E** socket, switch set to M.W., turn gang and volume control to maximum, feed in a 455 kc/s (659.3 m) signal, and adjust the cores of **L16, L15, L14, L13** (location references H5, B2, B2, K5) for maximum output.

R.F. and Oscillator Stages.—When carrying out the following operations reference should be made to our sketch of the tuning assembly in col. 1, where the positions of all adjustments are indicated. With the gang at maximum capacitance the cursor should coincide with the high wavelength ends of the three scales. Transfer "live" signal generator lead to **A** socket, via a suitable dummy aerial.

M.W.—Switch set to M.W., tune to 215 m on scale, feed in a 215 m (1,396 kc/s) signal, and adjust **C38** and **C33** for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the cores of **L8** and **L5** for maximum output. Check calibration at 350 m (857 kc/s) and repeat these operations if necessary.

S.W.—Switch set to S.W., tune to 18 m on scale, feed in an 18 m (16.67 Mc/s) signal, and adjust **C37** and **C32** for maximum output.

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust **C39** and **C34** for maximum output. Tune to 1,900 m on scale, feed in a 1,900 m (157.9 kc/s) signal, and adjust the cores of **L9** and **L6** for maximum output. Repeat these operations if necessary.



Rear view of the tuning assembly, with its cover off, as seen in an inverted chassis. The tag numbers are indicated, and the waveband switch unit can be seen behind the tag strip.

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